

## CLAIMS

What is claimed is:

1. An apparatus for forming a first state and a second state alternatively and sequentially on an optical recording medium in response to input data having a first level and a second level, respectively, in an optical recording apparatus, comprising:  
a recording waveform generating unit generating a recording waveform which includes a first multi-pulse having a plurality of first pulses corresponding to the first level of the input data and a second multi-pulse having a plurality of second pulses corresponding to the second level of the input data.
2. The apparatus of claim 1, further comprising:  
a pickup unit generating light to form the first state and the second state on the optical recording medium in accordance with the first multi-pulse and the second multi-pulse of the recording waveform generated from the recording waveform generating unit.
3. The apparatus of claim 2, wherein the pickup unit comprises:  
a laser device generating the light varying in accordance with the first pulses of the first multi-pulse and the second pulses of the second multi-pulse to form the first state and the second state on the optical recording medium.
4. The apparatus of claim 3, wherein the laser device has a voltage to generate the light, and the voltage varies according to the first pulses during forming the first state and in accordance with the second pulses during forming the second state.
5. The apparatus of claim 3, wherein the voltage is not a DC voltage.
6. The apparatus of claim 1, wherein the input data comprises NRZI data having a high potential and a low potential each representing one of the first level and the second level.
7. The apparatus of claim 1, wherein the first state is a mark, and the second state is a space.

8. The apparatus of claim 1, wherein the first multi-pulse is a recording pattern to form a mark, and the second multi-pulse is an erase pattern to form a space.

9. The apparatus of claim 1, wherein the recording waveform generating unit generates a cooling pulse extended from one of the first pulses of the first multi-pulse to one of second pulses of the second multi-pulse.

10. The apparatus of claim 9, wherein the cooling pulse forms a portion of the first pulses and a portion of the second pulses.

11. The apparatus of claim 1, wherein the first pulses of the first multi-pulse have a first high level and a first low level, and the second pulses of the second multi-pulse have a second high level and a second low level.

12. The apparatus of claim 11, wherein the second high level of the second pulses is smaller than the first high level of the first pulses.

13. The apparatus of claim 11, wherein the first pulses comprise a first starting pulse and a first ending pulse, and the second pulses comprise a second starting pulse and a second ending pulse, the first starting pulse varying in accordance with the second starting pulse and the second ending pulse of the second pulses.

14. The apparatus of claim 11, wherein the first pulses have a first duty cycle, and the second pulses a second duty cycle.

15. The apparatus of claim 14, wherein each second pulse comprises a high level and a low level, and the second duty cycle comprises:

a ratio of a duration time of the high level and another duration time of the low level in a range between  $0.25T$  and  $0.75T$ , where  $T$  is a cycle of a reference clock.

16. The apparatus of claim 1, further comprising:

a servo unit rotating the optical recording medium according to one of the first multi-

pulse and the second multi-pulse during forming the first state and the second state.

17. The apparatus of claim 16, wherein the second multi-pulse comprises a starting pulse and an ending pulse, and the servo unit controls a rotation speed of the optical recording medium in accordance with one of a starting pulse and an ending pulse of the second multi-pulse.

18. The apparatus of claim 1, wherein the recording waveform generating unit generates information data representing a characteristic of the second multi-pulse.

19. The apparatus of claim 18, wherein the information data is recorded on the optical recording medium as a wobble signal.

20. The apparatus of claim 18, further comprising:  
a servo unit rotating the optical recording medium in accordance with the information data.

21. The apparatus of claim 18, further comprising:  
a laser device recording the information data on the optical recording medium.

22. The apparatus of claim 21, wherein the optical recording medium comprises a lead-in-area, and the information data is recorded in the lead-in-area of the optical recording medium.

23. The apparatus of claim 21, further comprising:  
a servo unit reading the information data from the optical recording medium and rotating the optical recording medium at a speed corresponding to the information data.

24. The apparatus of claim 21, further comprising:  
a servo unit rotating the optical recording medium in a first speed, reading the information data from the optical recording medium, and rotating the optical recording medium at a second speed according to the information data.

25. An apparatus for forming a first state and a second state alternatively and sequentially on an information storage medium in response to input data having a first level and a second level, respectively, in a recording apparatus, comprising:

a recording waveform generating unit generating a recording waveform which comprises a first multi-pulse having a plurality of first pulses corresponding to the first level of the input data, a second multi-pulse having a plurality of second pulses corresponding to the second level of the input data, and a cooling pulse concatenating the first and second multi-pulses.